Cardiovascular Risk Factors in a Small Urban Community in Central Croatia

Davor Horvat

Department of Internal Diseases, General Hospital »Karlovac«, Karlovac, Croatia

A B S T R A C T

The aim of this study was to determine in Karlovac (southern part of central Croatia) the most important risk factors for coronary heart diseases in men and women according to age ≤59 and ≥60 on the basis of their prevalence in 558 non-coronary patients and 442 symptomatic coronary patients. In younger male coronary patients (≤59 years of age) in relation to the control study, the statistically significant more frequent risk factors were hypercholesterolemia (p<0.001), smoking (p<0.01) and diabetes (p<0.01). In older male patients (≥60 years of age) there was no statistically significant difference in a single risk factor. In younger female coronary patients, the statistically significant more frequent risk factors were hypercholesterolemia (p<0.001) and diabetes (p<0.001) and in older female patients diabetes (p<0.05). This population sample showed higher prevalence of cardiovascular risk factors in younger coronary patients. The most frequent risk factors were diabetes, hypercholesterolemia and smoking. The difference is slighter in older coronary patients where it is diabetes, which is the most important for women.

Key words: *coronary disease, risk factors, age distribution, sex distribution, Croatia*

Introduction

Today's attitudes show consistently higher prevalence of standard risk factors (hypertension, hypercholesterolemia, obesity, smoking, positive family anamnesis and diabetes) in patients suffering from coronary heart diseases (CHD) (angina pectoris and myocardial infarction) than in the control study[1]. The estimates show that the significance of an individual risk factor is considerably less if it occurs in-

dependently than if a patient suffers from more of them simultaneously[2]. Preventive measures around the world should be aimed at those always the same risk factors and the intervention should be global. However, one poses the question if some of the risk factors are more frequent and more important for development of coronary heart diseases depending on some regional, cultural and economical conditions[3]. The World Health Organization estimates that in 1996 heart and vascular diseases caused the death of 15 million people with 30% of the world's mortality. In Croatia the situation is even worse: the rate of cardiovascular mortality increased from 387.7 per 100,000 people in 1971 to 533.3 in 1996. Moreover, the portion of total mortality in the same period increased from 37.9% to 50.4%[4]. In the last 30 years one can notice the fall of cardiovascular mortality in developed countries and the rise of mortality in developing countries in transition. A global strategy of prevention requires good knowledge of the roles of certain cardiovascular risk factors in different parts of the world and in certain ethnic groups because there are some indications that their influence is regionally different[5]. The aim of this study is to determine for Karlovac (southern part of central Croatia) women according to age ≤59 and ≥60 on the basis of their prevalence in 558 non-coronary patients and 442 symptomatic coronary patients.

Subjects and Methods

A retrospective research will include the study of pairs (case-control study) and the patterns will be independent and stratified according to distinguishing criteria. The study will include the patients who were hospitalized in the Department of Cardiology of the General hospital Karlovac, Karlovac, Croatia from 1998 to 2001 and who have all necessary data

about all risk factors for cardiovascular disease. The case study will include all consecutive symptomatic (chest pain) coronary patients (stable and non stable angina pectoris as well as acute myocardial infarction with and without ST elevation) who were hospitalized for the first time. The control study will include all other patients without coronary heart diseases. The patients will be classified according to age (≤59 and ≥60). Cardiovascular risk factors, which will be researched, will be positive family anamnesis (coronary heart diseases in parents, brothers, sisters and children), obesity (BMI>25 m/kg[2]), existing type 2 diabetes, hypertension (existing >140/90 mmHg or drug treated), hypercholesterolemia (total cholesterol measured within 24 hours upon patients' arrival in hospital) and smoking more cigarettes a day (acute smokers and those who stopped smoking within 5 years will be included). As far as statistical methods are concerned, Chi- square analysis of small independent samples with Fisher's test as well as the test of proportions (z) for independent samples will be used.

Results

Concerning the control study, there were 771 non-coronary patients who were taken into consideration. However, 558 patients satisfied the criteria of the study and 213 patients were taken into consideration. However, 442 patients satisfied the criteria of the study and 184 patients were excluded from the study.

The study showed that in coronary patients the statistically significant more frequent risk factors were hypercholesterolemia (z=5.07; p<0.001), smoking (z= 2.21; p<0.01) and diabetes (z=2.1; p<0.01). Concerning other risk factors, there was no statistically significant difference between coronary and non-coronary patients (Table 1).

In coronary patients the statistically significant more frequent risk factors were hypercholesterolemia (z=4.67; p<0.001 and diabetes (z=2.62; p<0.001). In other patients there was no statistically significant difference between these two groups (Table 2).

There was no statistically significant difference concerning the risk factors between older male patients (Table 3).

In older female patients there was no statistically significant difference concerning the risk factors except for diabetes (z=1.76; p<0.05) (Table 4).

TABLE 1
MALE PATIENTS ≤59 YEARS OF AGE

Risk factors	Non-coronary		Coronary			
	N	%	N	%	z	p
Hypertension	81	63.78	51	58.62	0.75	ns
Hypercholesterolemia	71	55.91	77	88.51	5.07	0.001
Obesity	94	74.02	61	70.11	0.63	ns
Smoking	52	40.94	49	56.32	2.21	0.01
Family history	46	36.22	40	45.98	1.43	ns
Diabetes	11	8.66	16	18.39	2.1	0.01
Total	127	100.00	87	100.00		

TABLE 2
FEMALE PATIENTS ≤59 YEARS OF AGE

Risk factors	Non-coronary		Coronary			
	N	%	N	%	z	p
Hypertension	92	75.41	27	79.41	0.48	ns
Hypercholesterolemia	25	20.49	21	61.76	4.67	0.001
Obesity	96	78.69	29	85.29	0.85	ns
Smoking	31	25.41	9	26.47	0.12	ns
Family history	51	41.80	16	47.06	0.55	ns
Diabetes	16	13.11	11	32.35	2.62	0.001
Total	122	100.00	34	100.00		

TABLE 3
MALE PATIENTS ≥60 YEARS OF AGE

Risk factors	Non-coronary		Coronary			
	N	%	N	%	z	p
Hypertension	81	61.83	118	57.84	0.72	ns
Hypercholesterolemia	64	48.85	96	47.06	0.32	ns
Obesity	76	58.02	128	62.75	0.87	ns
Smoking	27	20.61	41	20.10	0.11	ns
Family history	47	35.88	66	32.35	0.67	ns
Diabetes	23	17.56	37	18.14	0.13	ns
Total	131	100.00	204	100.00		

TABLE 4
FEMALE PATIENTS ≥60 YEARS OF AGE

Risk factors	Non-coronary		Coronary			
	N	%	N	%	z	p
Hypertension	145	81.46	91	77.78	0.77	ns
Hypercholesterolemia	110	61.80	68	58.12	0.63	ns
Obesity	138	77.53	88	75.21	0.46	ns
Smoking	20	11.24	11	9.40	0.5	ns
Family history	78	43.82	61	52.14	1.4	ns
Diabetes	51	28.65	45	38.46	1.76	0.05
Total	178	100.00	117	100.00		

Discussion

This study showed greater difference, that is to say, higher frequency of risk factors for coronary heart diseases in younger patients. The most important risk factors were diabetes, hypercholesterolemia and smoking. In younger male coronary patients (≤59 years of age) in relation to the control study, the statistically significant more frequent risk factors were hypercholesterolemia (p<0.001), smoking (p<0.01) and diabetes (p<0.01) (Table 1). In older male patients (≥60 years of age) there was no statistically significant difference in a single risk factor (Table 2). In younger female coronary patients, the statistically significant more frequent risk factors were hypercholesterolemia (p<0.001) and diabetes (p<0.001) (Table 3) and in older female patients diabetes (p<0.05) (Table 4). The results on smoking in younger male coronary patients are in accordance with the published results of other studies which point out that smoking is a habit which is especially frequent in younger male coronary patients. Researches into heart and vascular diseases in Croatia in patients suffering from acute myocardial infarction less than 45 years of age have revealed the prevalence of smoking 80.5% in relation to 41.4% in older patients[6]. The data on today's postwar Croatian population reveal that there are about 31.4% male smokers and 26.6% female smokers in Croatia[3,7]. There are 1.1 billion smokers in the world today[4]. It is well known that mental stress can have an effect upon smoking as a form of risky behaviour[7]. Great prevalence of smoking in young male population in the researched area (for non-coronary patients 40.9% and coronary patients 56.3%) can be justified by men's more active role in the war and by greater exposure to postwar health and social problems in relation to other Croatian regions, which were less affected by the war. According to numerous studies, the level of cholesterol in blood along with age is the main predicable value for development of coronary heart diseases[8,9]. This study also showed significant influence of hypercholesterolemia upon development of coronary heart diseases in younger male and female patients. These results reveal still inadequate diagnosis and treatment of hypercholesterolemia in the researched area. A special problem, which is often associated with obesity, is diabetes, especially its more frequent form independent of insulin[5,10]. Anamnestic data on diabetes tripled the risk of acute myocardial infarction in INTER-HEART study: OR 3.02 with 99% Cl 2.66–3.43[1]. The results of this study also revealed a significant frequency of diabetes in younger male coronary patients and in both age groups of female coronary patients. This is also in accordance with today's re-

sult, which shows that diabetes is a more important risk factor in women than in men[5]. Hypertension was also greatly frequent in the control study, which can be explained by the fact that the patients were selected in the Department of Cardiology where a great number of patients are treated due to hypertension. The data of INTER-HEART study reveal that BMI > 30 kg/m^2 increases the risk of acute myocardial infarction for 23%[1]. The results in this study did not verify statistically significant frequency of obesity in any group of coronary patients. This can also be explained by less specific data on obesity because over well-fed patients were also taken into consideration (BMI>25 kg/m^2) causing thus great prevalence of the obese even in the control study. The possible shortcoming of this study is enclosure of positive family anamnesis without limitations to the age of the relatives. Future researches should also take these facts in to consideration. According to the results of this study, in Karlovac younger male population should be warned about diabetes, smoking and hypercholesterolemia, younger female population about hypercholesterolemia and diabetes and older female population should be warned about diabetes as the risk factors which are the most important factors for development of coronary heart diseases in these groups. For this purpose adequate preventive measures and diagnostic and therapy treatments should be implemented thus reducing influence of these risk factors. This study revealed greater prevalence of cardiovascular risk factors in younger coronary patients. The most frequent risk factors were diabetes, hypercholesterolemia and smoking. The difference is slighter in older coronary patients where it is diabetes, which is important for women. Importance of individual risk factors is more expressed in younger patients while in older patients there is identical incidence in both coronary and non-coronary patients.

REFERENCES

1. INTER-HEART PROJECT OFFICE STAFF, Am. Heart J., 141 (2001) 711. — 2. LUEPKER, R. V., L. RASTAM, P. J. HANNAN, D. M. MURRAY, C. GRAY, W. L. BAKER, R. CROW, D. R. JACOBS, P. L. PIRIE, S. R. MASCIOLO, M. B. MITTELMARK, H. BLACKBURN, Am. J. Epidemiol., 144 (1996) 351. — 3. RUMBOLDT, Z., M. RUMBOLDT, Liječnički vijesnik, 124 Suppl. 3 (2002) 19. — 4. LJUBIČIĆ, M., V. HRABAK ŽERJAVIĆ: Promicanje zdravlja u hrvatskom pučanstvu. (HZZJZ, Zagreb, 1999). — 5. YUSUF, S., S. REDDY, S. OUNPUU, S. ANAND, Circulation, 104 (2001) 2746. — 6. RUMBOLDT, Z., M. RUMBOLDT, Eur. Heart J., 19 (1998) 1410. — 7. KRANTZ, D. S., D. S. SHEPS, R. M. CARNEY, B. H. NATELSON, JAMA, 283 (2000) 1800. — 8. HIGGINS, M., W. KANNEL, R. GARRISON, J. PINSKY, J. STROKES, Acta Med. Scand., 723 Suppl. (1988) 23. — 9. STAMLER, J., M. L. DAVIGLUS, D. B. GARSIDE, A. R. DYER, P. GREENLAND, J. D. NEATON, JAMA, 284 (2000) 311. — 10. DONATO, K., WHL Newsletter, 81 (2002) 1.

D. Horvat

Department of Internal Diseases, General Hospital »Karlovac«, Andrije Štampara 3, 47000 Karlovac, Croatia

ČIMBENICI RIZIKA ZA RAZVOJ KARDIOVASKULARNIH BOLESTI U STANOVNIŠTVU MALE URBANE ZAJEDNICE U SREDIŠNJOJ HRVATSKOJ

S A Ž E T A K

Cilj istraživanja bio je odrediti na karlovačkom području (južni dio središnje Hrvatske) najvažnije kardiovaskularne čimbenike rizika koronarne bolesti srca kod muškaraca i žena prema dobi ≤59 godina i ≥60 godina na temelju usporedbe njihove prevalencije kod 558 nekoronarnih bolesnika i 442 simptomatska koronarna bolesnika. U mlađoj muškoj populaciji koronarnih bolesnika (≤59 godina) statistički značajno učestaliji faktori rizika u odnosu na kontrolnu skupinu su bili hiperkolesterolemija ($p < 0,001$), pušenje ($p < 0,01$) i dijabetes ($p < 0,01$), a u starijoj (≥60 godina) nije bilo statistički značajne razlike ni u jednom čimbeniku rizika. U mlađoj ženskoj populaciji koronarnih bolesnika statistički je značajno češći čimbenik rizika bio hiperkolesterolemija ($p < 0,001$) i dijabetes ($p < 0,001$), a u starijoj populaciji dijabetes ($p < 0,05$). Ovaj populacijski uzorak je pokazao veću prevalenciju kardiovaskularnih čimbenika rizika u mlađoj populaciji koronarnih bolesnika, a najveći su čimbenici rizika dijabetes, hiperkolesterolemija i pušenje. Manja je razlika u prevalenciji kod starijih koronarnih bolesnika gdje je za žene najvažniji dijabetes.